Claims

What is claimed is:

Sub A2

1. An implantable medical device (IMD) adapted for implantation within a body, comprising:

an elongated body having a proximal end and a distal end, the distal end including an inner lumen; and

a helix residing within the inner lumen and adapted to be extended beyond the distal end of the elongated body, at least a portion of the helix having a diameter that is larger than the diameter of the elongated body when the helix is extended.

2. The IMD of Claim 1, and further comprising a fixation assembly coupled to a proximal end of the helix, the fixation assembly being adapted to allow for retraction of the helix such that the helix re-assumes a compressed configuration within the inner lumen.

3. The IMD of Claim 2, wherein the fixation assembly includes a coupling member to interface with a stiffening member.

4. The IMD of Claim 3, wherein the fixation assembly includes means to allow the helix to be extended and retracted by rotation of the stiffening member in a respective predetermined direction.

5. The IMD of Claim 1, wherein the diameter of the helix when the helix is extended is substantially constant.

6. The IMD of Claim 1, wherein the diameter of the helix when the helix is extended decreases towards a distal end of the helix.

7. The IMD of Claim 1, and further including a conductor coupled to the helix whereby the helix may be used to deliver electrical stimulation.

8. The IMD of Claim 7, wherein the conductor is a coiled conductor configured such that the helix may be extended and retracted by rotation imparted to a proximal end of the coiled conductor in a predetermined respective direction.

9. The IMD of Claim 1, wherein the helix is formed of a super elastic material.

10. The IMD of Claim 9, wherein the super elastic material is a shape memory alloy.

11. The IMD of Claim 1, wherein the elongated body is further coupled to a sensor to sense a physiological signal.

12. The IMD of Claim 11, wherein the sensor is selected from a group consisting of a pressure sensor, an O_2 saturation sensor, a temperature sensor, a flow sensor, an impedance sensor, a stroke volume sensor, and a pH sensor.

13. The IMD of Claim 1, wherein the helix includes a lumen configured to allow blood flow to continue in an unimpeded manner at an implant site within the body.

14. The IMD of Claim 1, and further including at least one ring electrode carried on the elongated body and coupled to a respective conductor to allow for multi-polar pacing.

15. The IMD of Claim 1, wherein the at least one ring electrode includes a first ring electrode adapted to be located within the right atrium, and a second ring electrode adapted to provide electrical stimulation to the left atrium.

16. The IMD of Claim 1, and further including at least one defibrillation electrode carried on the elongated body.

17. The IMD of Claim 2, wherein the fixation assembly includes a helical lumen to guide the helix during extension and retraction.

18. The IMD of Claim 17, wherein the helical lumen includes a seal adapted to prevent the ingress of fluids.

19. The IMD of Claim 1, wherein the elongated body is a body of an implantable medical lead.

20. A method of retaining an implantable medical device (IMD) at a desired implant site within a body, wherein the IMD includes an elongated body having a distal end including a lumen, and an expandable helix residing within the lumen, the method comprising the methods of:

a.) guiding the distal end of the IMD to the desired implant site; and

b.) advancing the helix beyond the distal end so that the helix expands, and whereby at least a portion of the helix has a diameter larger than the diameter of the elongated body.

21. The method of Claim 20, wherein the helix is coupled to a coiled conductor, and wherein method b.) includes the method of rotating a proximal end of the coiled conductor.

22. The method of Claim 20, wherein the helix is coupled to a fixation assembly, and wherein method b.) includes the methods of:

coupling a stiffening member to the fixation assembly; and

rotating the stiffening member.

23. The method of Claim 20, and further including the methods of:

retracting the helix into the lumen; and

moving the distal end of the elongated body.

24. The method of Claim 23, wherein the retracting method includes the method of compressing the helix.

25. The method of Claim 20, wherein the helix is coupled to a conductor, and further including the method of utilizing the advanced helix to deliver electrical stimulation to the body.

26. The method of Claim 25, wherein the elongated body further carries a ring electrode, and wherein the method of Claim 25 includes delivering the electrical stimulation between the helix and the ring electrode.

27. The method of Claim 26, wherein the elongated body carries multiple ring electrodes, and further including the method of utilizing one or more predetermined ones of the multiple ring electrodes to delivery electrical stimulation to one or more locations within the body other than the desired implant site.

28. The method of Claim 20, wherein the elongated body carries a defibrillation electrode, and further including the method of utilizing the defibrillation electrode to deliver electrical stimulation to the body.

29. The method of Claim 20, wherein the elongated body includes a physiologic sensor, and further including the method of utilizing the physiologic sensor to sense a physiological signal within the body.

30. The method of Claim 20, wherein the implant site is located within a vessel of a body, and wherein method b.) includes expanding the helix to contact at least one wall of the vessel.

31. A medical lead adapted for implantation within the coronary sinus, comprising:

a lead body having a distal end that defines an inner recess; and

an expandable helix residing within the inner recess that is adapted to be advanced outside the inner recess, at least a portion of the helix being capable of expanding to have a diameter that is larger than the diameter of the lead body.

32. The medical lead of Claim 31, and further comprising a fixation assembly coupled to a proximal end of the expandable helix, the fixation assembly being adapted to allow for retraction of the helix such that the helix assumes a compressed configuration within the inner recess.

33. The medical lead of Claim 31, and further including a conductor coupled to the helix, and wherein the helix is adapted to expand to contact at least one inner wall of the coronary sinus to deliver electrical stimulation thereto.

34. The medical lead of Claim 33, and further including at least one ring electrode carried on the lead body.

35. The medical lead of Claim 31, and further including a physiological sensor carried on the lead body.